Electronic Version
Stylesheet Version v1.1.1

Claims

[c1] A backplane for an electro-optic display, the backplane comprising a pixel electrode, a voltage supply line arranged to supply a voltage to the pixel electrode, and a micromechanical switch disposed between the voltage supply line and the pixel electrode, the micromechanical switch having an open state, in which the voltage supply line is not electrically connected to the pixel electrode, and a closed state, in which the voltage supply line is electrically connected to the pixel electrode.

[c2] A backplane according to claim 1 wherein the micromechanical switch comprises a cantilever beam capable on moving into and out of contact with a first electrode, and a second electrode arranged to move the cantilever beam.

[c3] A backplane according to claim 2 further comprising a capacitor electrode disposed adjacent the first electrode such that the capacitor electrode and the first electrode form a capacitor.

[c4] A backplane according to claim 1 further comprising an encapsulant layer covering the micromechanical switch.

[c5] An electro-optic display comprising:
a layer of an electro-optic medium having first and second display states differing in at least one optical property, the electro-optic medium being capable of being changed from its first to its second display state by application of an electric field to the medium; and
a backplane disposed adjacent the layer of electro-optic medium, the backplane comprising a pixel electrode arranged, upon application of a voltage thereto, to apply an electric field to the electro-optic medium, the backplane further comprising a voltage supply line arranged to supply a voltage to the pixel electrode, and a micromechanical switch disposed between the voltage supply line and the pixel electrode, the micromechanical switch having an open state, in which the voltage supply line is not electrically connected to the pixel electrode, and a closed state, in which the voltage supply line is electrically connected to the pixel electrode.

[c6] An electro-optic display according to claim 5 wherein the micromechanical switch comprises a cantilever beam capable on moving into and out of contact with a first electrode, and a second electrode arranged to move the cantilever beam.

[c7] An electro-optic display according to claim 6 wherein the

backplane further comprises a capacitor electrode disposed adjacent the first electrode such that the capacitor electrode and the first electrode form a capacitor.

[c8] An electro-optic display according to claim 5 further comprising an encapsulant layer covering the micromechanical switch.

[c9] An electro-optic display according to claim 5 further comprising a light transmissive electrode disposed on the opposed side of the layer of electro-optic medium from the backplane.

[c10] An electro-optic display according to claim 5 wherein the electro-optic medium is a rotating bichromal member or electrochromic medium.

[c11] An electro-optic display according to claim 5 wherein the electro-optic medium is an encapsulated electrophoretic medium.

[c12] A process for forming a backplane for an electro-optic display, the process comprising:
providing a substrate;
forming spaced first, second and third electrodes on the substrate;
thereafter forming a sacrificial layer on the substrate, the sacrificial layer covering the first and second electrodes

but leaving at least part of the third electrode exposed; thereafter depositing conductive material on to the substrate so as to form a cantilever beam member having a first section contacting the exposed part of the third electrode, and a second section extending over the sacrificial layer so as to extend over at least part of each of the second and first electrodes; and
thereafter removing the sacrificial layer, thereby leaving the second section of the cantilever beam member free to into and out of contact with the first electrode under the influence of a voltage applied to the second electrode.

[c13] A process according to claim 12 wherein the step of depositing conductive material on to the substrate further comprises depositing a capacitor electrode spaced from the cantilever beam member but overlying part of the first electrode so that the capacitor electrode and the first electrode together form a capacitor.

[c14] A process according to claim 12 further comprising, after removal of the sacrificial layer, depositing an encapsulant layer on to the substrate so as to cover at least the cantilever beam member.

[c15] A process for forming at least one electronic component of an electronic circuit on a substrate, the process com-

prising:

forming on the substrate a layer of a component material which can form the at least one electronic component;

forming a layer of an embossable material over the layer of component material;

imagewise embossing the layer of embossable material to form at least one first portion and at least one second portion having a greater thickness than that of the at least one first portion;

etching the embossable material to remove the at least one first portion thereof while leaving embossable material present in the at least one second portion thereof, thereby exposing the component material underlying the at least one first portion of the embossable material;

thereafter etching the exposed portions of the component material, thereby patterning the layer of component material and forming the at least one electronic component therein.

[c16] A process according to claim 15 further comprising, after patterning of the layer of component material, removing the remaining embossable material from the substrate.

[c17] A process according to claim 15 wherein the imagewise embossing of the embossable material is effected by a roller.

[c18] A process according to claim 15 wherein the embossable material comprises a photoresist.

[c19] A process according to claim 18 wherein the photoresist is heated prior to the imagewise embossing thereof, the heating serving to remove solvent from the photoresist.

[c20] A process according to claim 18 wherein the photoresist is heated after the etching to remove the at least one first portion thereof, but before the etching of the component material.

[c21] A process according to claim 15 wherein the embossable material comprises a copolymer having repeating units derived from at least one base soluble monomer.

[c22] A process according to claim 21 wherein the at least one base soluble monomer comprises a blocking group which deblocks in the presence of an acid.

[c23] A process according to claim 21 wherein the copolymer comprises repeating units derived from 4-hydroxystyrene and a methacrylate.

[c24] A backplane for an electro-optic display, the backplane comprising:
a substrate;
a transistor disposed on the substrate;

a passivation layer covering the transistor;
a pixel electrode disposed on the opposed side of the passivation layer from the transistor; and
a conductive via passing through the passivation layer and electrically connecting the transistor to the pixel electrode,
wherein the passivation layer comprises a polymer selected from the group consisting of epoxy, polyurethane, silicon, polyacrylate and polyimide polymers.

[c25] A backplane according to claim 24 wherein the passivation layer comprises a thermally curable polymer.

[c26] A backplane according to claim 24 wherein the passivation layer comprises a radiation curable polymer.

[c27] A backplane according to claim 24 wherein the substrate comprises a metal film covered with an insulating layer, the transistor being formed on the insulating layer.

[c28] A backplane according to claim 27 wherein the substrate comprises a stainless steel foil covered with a polyimide insulating layer.

[c29] An electro-optic display comprising:
a layer of an electro-optic medium having first and second display states differing in at least one optical property, the electro-optic medium being capable of being

changed from its first to its second display state by application of an electric field to the medium;

a backplane according to claim 24 disposed adjacent the layer of electro-optic medium, and arranged, upon application of a voltage to the pixel electrode thereof, to apply an electric field to the electro-optic medium.